

What is claimed is:

1. A machine-implemented method, comprising:
 2. creating, within a global operating system environment provided by an operating system, a first non-global partition which serves to isolate processes running within that partition from other non-global partitions within the global operating system environment; and
 6. establishing a first file system for the first non-global partition, wherein the first file system cannot be accessed by processes running in any non-global partition other than the first non-global partition, and wherein the first file system comprises at least one virtual directory, which has associated therewith a reference to another particular file system directory.
 1. 2. The method of claim 1, wherein the virtual directory is part of a virtual file system, which has been mounted into the first file system.
 1. 2. 3. The method of claim 2, wherein the virtual file system is a loopback file system.
 1. 2. 4. The method of claim 1, wherein establishing the first file system comprises:
 3. mounting the other particular file system directory onto the virtual directory.
 1. 5. The method of claim 4, wherein mounting comprises:

2 storing a set of semantics associated with the virtual directory, wherein the set of
3 semantics indicates that the virtual directory is part of a virtual file system.

1 6. The method of claim 5, wherein the set of semantics further comprises the
2 reference to the other particular file system directory.

1 7. The method of claim 1, wherein the first file system has a first root
2 directory associated therewith, wherein the first file system is a portion of an overall file
3 system associated with the global operating system environment, wherein the overall file
4 system has an overall root directory which is above the first root directory in a directory
5 hierarchy, and wherein processes running with the first non-global partition cannot
6 traverse above the first root directory in the directory hierarchy.

1 8. The method of claim 1, wherein the first file system is a portion of an
2 overall file system associated with the global operating system environment, and wherein
3 the other particular file system directory resides in a portion of the overall file system that
4 is not a part of the first file system.

1 9. The method of claim 1, wherein the virtual directory comprises no actual
2 files or directories.

1 10. The method of claim 1, wherein the other particular file system directory,
2 or a subdirectory thereof, comprises one or more actual files.

1 11. The method of claim 10, wherein processes running within the first non-
2 global partition have read-only access to the one or more actual files.

1 12. The method of claim 1, wherein the other particular file system directory
2 is a virtual directory, which has associated therewith a reference to yet another file
3 system directory.

1 13. The method of claim 1, further comprising:
2 creating, within the global operating system environment, a second non-global
3 partition which serves to isolate processes running within that partition from other non-
4 global partitions within the global operating system environment; and
5 establishing a second file system for the second non-global partition, wherein the
6 second file system cannot be accessed by processes running in any non-global partition
7 other than the second non-global partition, and wherein the second file system comprises
8 at least one virtual directory, which has associated therewith a reference to the other
9 particular file system directory.

1 14. The method of claim 13, wherein the other particular file system directory,
2 or a subdirectory thereof, comprises one or more actual files which are shared by the first
3 and second non-global partitions.

1 15. The method of claim 13, wherein establishing the second file system
2 comprising:

3 mounting the other particular file system directory onto the virtual directory of the
4 second file system.

1 16. The method of claim 15, wherein mounting comprises:
2 storing a second set of semantics associated with the virtual directory of the
3 second file system, wherein the second set of semantics indicates that the virtual directory
4 of the second file system is part of a second virtual file system, and wherein the second
5 set of semantics further comprises the reference to the other particular file system
6 directory.

1 17. The method of claim 1, further comprising:
2 receiving a request from a process running within the first non-global partition to
3 access a particular file;
4 traversing the first file system to the virtual directory;
5 following the reference to the other particular file system directory; and
6 accessing the particular file from the other particular file system directory, or a
7 subdirectory thereof.

1 18. The method of claim 17, wherein accessing the particular file comprises:
2 determining whether a copy of the particular file is already in virtual memory; and

3 in response to a determination that a copy of the particular file is already in virtual
4 memory, using the copy already in virtual memory rather than making another copy in
5 the virtual memory.

1 19. An apparatus, comprising:

2 a mechanism for creating, within a global operating system environment provided
3 by an operating system, a first non-global partition which serves to isolate processes
4 running within that partition from other non-global partitions within the global operating
5 system environment; and

6 a mechanism for establishing a first file system for the first non-global partition,
7 wherein the first file system cannot be accessed by processes running in any non-global
8 partition other than the first non-global partition, and wherein the first file system
9 comprises at least one virtual directory, which has associated therewith a reference to
10 another particular file system directory.

1 20. The apparatus of claim 19, wherein the virtual directory is part of a virtual
2 file system, which has been mounted into the first file system.

1 21. The apparatus of claim 20, wherein the virtual file system is a loopback
2 file system.

1 22. The apparatus of claim 19, wherein the mechanism for establishing the
2 first file system comprises:

3 a mechanism for mounting the other particular file system directory onto the
4 virtual directory.

1 23. The apparatus of claim 22, wherein the mechanism for mounting
2 comprises:

3 a mechanism for storing a set of semantics associated with the virtual directory,
4 wherein the set of semantics indicates that the virtual directory is part of a virtual file
5 system.

1 24. The apparatus of claim 23, wherein the set of semantics further comprises
2 the reference to the other particular file system directory.

1 25. The apparatus of claim 19, wherein the first file system has a first root
2 directory associated therewith, wherein the first file system is a portion of an overall file
3 system associated with the global operating system environment, wherein the overall file
4 system has an overall root directory which is above the first root directory in a directory
5 hierarchy, and wherein processes running with the first non-global partition cannot
6 traverse above the first root directory in the directory hierarchy.

1 26. The apparatus of claim 19, wherein the first file system is a portion of an
2 overall file system associated with the global operating system environment, and wherein
3 the other particular file system directory resides in a portion of the overall file system that
4 is not a part of the first file system.

1 27. The apparatus of claim 19, wherein the virtual directory comprises no
2 actual files or directories.

1 28. The apparatus of claim 19, wherein the other particular file system
2 directory, or a subdirectory thereof, comprises one or more actual files.

1 29. The apparatus of claim 28, wherein processes running within the first non-
2 global partition have read-only access to the one or more actual files.

1 30. The apparatus of claim 19, wherein the other particular file system
2 directory is a virtual directory, which has associated therewith a reference to yet another
3 file system directory.

1 31. The apparatus of claim 19, further comprising:
2 a mechanism for creating, within the global operating system environment, a
3 second non-global partition which serves to isolate processes running within that partition
4 from other non-global partitions within the global operating system environment; and
5 a mechanism for establishing a second file system for the second non-global
6 partition, wherein the second file system cannot be accessed by processes running in any
7 non-global partition other than the second non-global partition, and wherein the second
8 file system comprises at least one virtual directory, which has associated therewith a
9 reference to the other particular file system directory.

1 32. The apparatus of claim 31, wherein the other particular file system
2 directory, or a subdirectory thereof, comprises one or more actual files which are shared
3 by the first and second non-global partitions.

1 33. The apparatus of claim 31, wherein the mechanism for establishing the
2 second file system comprising:
3 a mechanism for mounting the other particular file system directory onto the
4 virtual directory of the second file system.

1 34. The apparatus of claim 33, wherein the mechanism for mounting
2 comprises:
3 a mechanism for storing a second set of semantics associated with the virtual
4 directory of the second file system, wherein the second set of semantics indicates that the
5 virtual directory of the second file system is part of a second virtual file system, and
6 wherein the second set of semantics further comprises the reference to the other particular
7 file system directory.

1 35. The apparatus of claim 19, further comprising:
2 a mechanism for receiving a request from a process running within the first non-
3 global partition to access a particular file;
4 a mechanism for traversing the first file system to the virtual directory;

5 a mechanism for following the reference to the other particular file system
6 directory; and
7 a mechanism for accessing the particular file from the other particular file system
8 directory, or a subdirectory thereof.

1 36. The apparatus of claim 35, wherein the mechanism for accessing the
2 particular file comprises:

3 a mechanism for determining whether a copy of the particular file is already in
4 virtual memory; and
5 a mechanism for using, in response to a determination that a copy of the particular
6 file is already in virtual memory, the copy already in virtual memory rather than making
7 another copy in the virtual memory.

1 37. A machine-readable medium, comprising:

2 instructions for causing one or more processors to create, within a global
3 operating system environment provided by an operating system, a first non-global
4 partition which serves to isolate processes running within that partition from other non-
5 global partitions within the global operating system environment; and
6 instructions for causing one or more processors to establish a first file system for
7 the first non-global partition, wherein the first file system cannot be accessed by
8 processes running in any non-global partition other than the first non-global partition, and
9 wherein the first file system comprises at least one virtual directory, which has associated
10 therewith a reference to another particular file system directory.

1 38. The machine-readable medium of claim 37, wherein the virtual directory
2 is part of a virtual file system, which has been mounted into the first file system.

1 39. The machine-readable medium of claim 38, wherein the virtual file system
2 is a loopback file system.

1 40. The machine-readable medium of claim 37, wherein the instructions for
2 causing one or more processors to establish the first file system comprises:
3 instructions for causing one or more processors to mount the other particular file
4 system directory onto the virtual directory.

1 41. The machine-readable medium of claim 40, wherein the instructions for
2 causing one or more processors to mount comprises:
3 instructions for causing one or more processors to store a set of semantics
4 associated with the virtual directory, wherein the set of semantics indicates that the
5 virtual directory is part of a virtual file system.

1 42. The machine-readable medium of claim 41, wherein the set of semantics
2 further comprises the reference to the other particular file system directory.

1 43. The machine-readable medium of claim 37, wherein the first file system
2 has a first root directory associated therewith, wherein the first file system is a portion of

3 an overall file system associated with the global operating system environment, wherein
4 the overall file system has an overall root directory which is above the first root directory
5 in a directory hierarchy, and wherein processes running with the first non-global partition
6 cannot traverse above the first root directory in the directory hierarchy.

1 44. The machine-readable medium of claim 37, wherein the first file system is
2 a portion of an overall file system associated with the global operating system
3 environment, and wherein the other particular file system directory resides in a portion of
4 the overall file system that is not a part of the first file system.

1 45. The machine-readable medium of claim 37, wherein the virtual directory
2 comprises no actual files or directories.

1 46. The machine-readable medium of claim 37, wherein the other particular
2 file system directory, or a subdirectory thereof, comprises one or more actual files.

1 47. The machine-readable medium of claim 46, wherein processes running
2 within the first non-global partition have read-only access to the one or more actual files.

1 48. The machine-readable medium of claim 37, wherein the other particular
2 file system directory is a virtual directory, which has associated therewith a reference to
3 yet another file system directory.

1 49. The machine-readable medium of claim 37, further comprising:
2 instructions for causing one or more processors to create, within the global
3 operating system environment, a second non-global partition which serves to isolate
4 processes running within that partition from other non-global partitions within the global
5 operating system environment; and
6 instructions for causing one or more processors to establish a second file system
7 for the second non-global partition, wherein the second file system cannot be accessed by
8 processes running in any non-global partition other than the second non-global partition,
9 and wherein the second file system comprises at least one virtual directory, which has
10 associated therewith a reference to the other particular file system directory.

1 50. The machine-readable medium of claim 49, wherein the other particular
2 file system directory, or a subdirectory thereof, comprises one or more actual files which
3 are shared by the first and second non-global partitions.

1 51. The machine-readable medium of claim 49, wherein the instructions for
2 causing one or more processors to establish the second file system comprises:
3 instructions for causing one or more processors to mount the other particular file
4 system directory onto the virtual directory of the second file system.

1 52. The machine-readable medium of claim 51, wherein the instructions for
2 causing one or more processors to mount comprises:

3 instructions for causing one or more processors to store a second set of semantics
4 associated with the virtual directory of the second file system, wherein the second set of
5 semantics indicates that the virtual directory of the second file system is part of a second
6 virtual file system, and wherein the second set of semantics further comprises the
7 reference to the other particular file system directory.

1 53. The machine-readable medium of claim 37, further comprising:
2 instructions for causing one or more processors to receive a request from a
3 process running within the first non-global partition to access a particular file;
4 instructions for causing one or more processors to traverse the first file system to
5 the virtual directory;
6 instructions for causing one or more processors to follow the reference to the
7 other particular file system directory; and
8 instructions for causing one or more processors to access the particular file from
9 the other particular file system directory, or a subdirectory thereof.

1 54. The machine-readable medium of claim 53, wherein the instructions for
2 causing one or more processors to access the particular file comprises:
3 instructions for causing one or more processors to determine whether a copy of
4 the particular file is already in virtual memory; and
5 instructions for causing one or more processors to use, in response to a
6 determination that a copy of the particular file is already in virtual memory, the copy
7 already in virtual memory rather than making another copy in the virtual memory.